

PRELIMINARY AMENDMENT
REISSUE OF U. S. PATENT APPLICATION NO. 6,628,606

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A device for estimating a coarse frequency offset, which is included in a frequency offset estimator of an orthogonal frequency division multiplexing (OFDM) receiver, the device comprising:

a buffer for receiving demodulated symbol $X(k)$ and cyclic shifting the symbol $X(k)$ by a predetermined shift amount d and outputting shifted symbol $X(k+d)$;

a reference symbol generator for generating a reference symbol $Z(k)$;

a counter for counting the shift amount of d ;

a ~~partial correlation~~ correlator for calculating a length m of K divided bands according to a time offset value and receiving the shifted symbol $X(k+d)$ and the phase reference symbol $Z(k)$ and calculating a partial correlation value

$$\left[\sum_{m=0}^{K-1} \left| \sum_{k=m(N/K)}^{(m+1)(N/K)-1} X((k+d)_N) Z^*(k) \right| \right]$$

with respect to the K divided bands, wherein a range of shift amount d is between $-N/2$ and $N/2$;
and

a maximum detector for obtaining a shift amount of d by which the partial correlation value is maximum, and outputting the shift amount of d as an estimated coarse frequency offset value.

PRELIMINARY AMENDMENT
REISSUE OF U. S. PATENT APPLICATION NO. 6,628,606

2. (original): The device of claim 1, wherein the number of divided bands, K , is set to be within $2T_{\text{off}}$ when a timing synchronization offset which can be covered by frame synchronization is set to be T_{off} .

3. (currently amended): A method of estimating a coarse frequency offset in an orthogonal frequency division multiplexing (OFDM) receiver which performs OFDM demodulation and frequency synchronization, the method comprising the steps of:

- (a) generating a reference symbol $Z(k)$;
- (b) counting the shift amount of \mathbf{d} ;
- (c) calculating a length m of K divided bands according to a time offset value and
receiving the shifted symbol $X(k+\mathbf{d})$ and the phase reference symbol $Z(k)$;
- (d) calculating a partial correlation value

$$\left[\sum_{m=0}^{K-1} \left| \sum_{k=m(N/K)}^{(m+1)(N/K)-1} X((k+\mathbf{d})_N) Z^*(k) \right| \right]$$

with respect to K divided bands, wherein a range of shift amount \mathbf{d} is between $-N/2$ and $N/2$; and

- (e) obtaining a shift amount of \mathbf{d} by which the partial correlation value is maximum, and outputting the shift amount of \mathbf{d} as an estimated coarse frequency offset value.

4. (original) The device of claim 3, wherein the number of divided bands, K , is set to be within $2T_{\text{off}}$ when a timing synchronization offset which can be covered by frame synchronization is set to be T_{off} .

5. (currently amended): An orthogonal frequency division multiplexing (OFDM) receiver comprising:

PRELIMINARY AMENDMENT

REISSUE OF U. S. PATENT APPLICATION NO. 6,628,606

a buffer for receiving demodulated symbol $X(k)$ and cyclic shifting the symbol $X(k)$ by a predetermined shift amount d and outputting shifted symbol $X(k+d)$;

a reference symbol generator for generating a reference symbol $Z(k)$;

a counter for counting the shift amount of d ;

a ~~partial correlation~~ correlator for calculating a length m of K divided bands according to a time offset value and receiving the shifted symbol $X(k+d)$ and the phase reference symbol $Z(k)$ and calculating a partial correlation value

$$\left[\sum_{m=0}^{K-1} \left| \sum_{k=m(N/K)}^{(m+1)(N/K)-1} X(((k+d)_N) Z^*(k)) \right| \right]$$

with respect to the K divided bands, wherein a range of shift amount d is between $-N/2$ and $N/2$;
and

a maximum detector for obtaining a shift amount of d by which the partial correlation value is maximum, and outputting the shift amount of d as an estimated coarse frequency offset value.

6. (original): The device of claim 5, wherein the number of divided bands, K , is set to be within $2T_{\text{off}}$ when a timing synchronization offset which can be covered by frame synchronization is set to be T_{off} .